

NOTICE

All drawings located at the end of the document.

**Environmental Restoration
RFCA Standard Operating Protocol
for Routine Soil Remediation
FY04 Notification #04-06
IHSS Group 800-3**

November 2003

**Environmental Restoration
RFCA Standard Operating Protocol
for Routine Soil Remediation
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Approval received from the Colorado Department of Public Health and Environment

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Approval letter is contained in the Administrative Record.

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ACRONYMS

AL	action level
BMP	best management practice
CDPHE	Colorado Department of Public Health and Environment
cy	cubic yard
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
EDDIE	Environmental Data Dynamic Information Exchange
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation
FY	Fiscal Year
HRR	Historical Release Report
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
MDL	method detection limit
ug/l	microgram per liter
mg/l	milligram per liter
nCi/g	nanocuries per gram
NPWL	New Process Waste Lines
OPWL	Original Process Waste Lines
PAC	Potential Area of Concern
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PCOC	potential contaminant of concern
pCi/g	picoCuries per gram
POC	Point of Compliance
POE	Point of Evaluation
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RSOP	RFCA Standard Operating Protocol
SAP	Sampling and Analysis Plan
SSRS	Subsurface Soil Risk Screen
SVOC	semi-volatile organic compound
TCE	trichloroethene
TPH	total petroleum hydrocarbons
UBC	Under Building Contamination
VOC	volatile organic compound
WRW	wildlife refuge worker

1.0 INTRODUCTION

This Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) Fiscal Year (FY) 04 Notification addresses the remediation of Individual Hazardous Substance Sites (IHSSs) at the Rocky Flats Environmental Technology Site (RFETS) Industrial Area (IA). The purpose of this Notification is to invoke the ER RSOP for IHSS Group 800-3. The IHSSs/Potential Areas of Concern (PACs) and Under Building Contamination (UBC) Sites associated with IHSS Group 800-3 are as follows:

- UBC 883
- Valve Vault 2 - PAC 800-1200
- Tank 25, Original Process Waste Lines (OPWL) (750-Gallon Steel Tank) - PAC 000-121
- Tank 26, OPWL (750-Gallon Steel Tank) - PAC 000-121
- Radioactive Site South of Building 883 - PAC 800-1201

In addition to these sites, this Notification also invokes the ER RSOP for Transformer Site 15 located north of Building 883, and the Building 883 storage area located adjacent to the building on its western side (northern half).

Soil with contaminant concentrations greater than the RFCA action levels (ALs), or as indicated by the Subsurface Soil Risk Screen (SSRS), and associated debris will be removed in accordance with RFCA (DOE et al 1996, 2003) and the ER RSOP (DOE 2003a).

The location of IHSS Group 800-3 is shown on Figure 1. All associated IHSSs, PACs and UBC Sites in IHSS Group 800-3 are proposed for remediation under ER RSOP Notification #04-06 (Table 1).

Table 1
Potential Remediation Areas for IHSS Group 800-3

IHSS/PAC/UBC Site	PCOCs	Media	Estimated Remediation Volume
UBC 883	Radionuclides Metals VOCs SVOCs	Building Debris and Subsurface Soil	Debris - ~6,000 cy Soil - < 5 cy
Valve Vault 2 - PAC 800-1200	Radionuclides Metals VOCs SVOCs	Valve Vault Debris and Subsurface Soil	Debris - <10 cy Soil - < 5 cy

IHSS/PAC/UBC Site	PCOCs	Media	Estimated Remediation Volume
Tank 25, OPWL (750-Gallon Steel Tank) - PAC 000- 121	Radionuclides Metals VOCs SVOCs	Tank Debris and Surface and Subsurface Soil	Debris - <10 cy Soil - < 5 cy
Tank 26, OPWL (750-Gallon Steel Tank) - PAC 000- 121	Radionuclides Metals VOCs SVOCs	Tank Debris and Surface and Subsurface Soil	Debris - < 10 cy Soil - < 5 cy
Radioactive Site South of Building 883 - PAC 800- 1201	Radionuclides	Surface Soil	Debris - < 10 cy Soil - < 5 cy

In addition to IHSS Group 800-3, Transformer Site 15 located north of Building 883, and the Building 883 storage area located west of the building are included in this Notification. Surface soil contamination is evident at Transformer Site 15, and building personnel suspect surface soil contamination may be present at the Building 883 storage area. Potential contaminants of concern (PCOCs) for both of these sites include radionuclides, metals, and semi-volatile organic compounds (SVOCs). Polychlorinated biphenyls (PCBs) are also PCOCs for Transformer Site 15.

Activities specified in the ER RSOP (DOE 2003a) are not reiterated here; however, deviations from the ER RSOP are included where appropriate.

2.0 IHSS GROUP 800-3

Soil contaminant concentrations greater than the Site background means plus two standard deviations (radionuclides and metals) or the method detection limits [MDLs] (organics) are depicted in Figure 2.

2.1 PCOCs

PCOCs for IHSS Group 800-3 are listed in Table 1. The PCOCs were determined based on surface soil sampling, as shown on Figure 2, and process knowledge.

Only two surface soil samples were collected near IHSS Group 800-3; the one closest to Building 883 was for characterization of Transformer Site 15. The data indicate radionuclides, metals, SVOCs, and PCBs are present above background levels (Figure 2). No subsurface soil sampling data exist in the area of IHSS Group 800-3.

With respect to process knowledge, radionuclides, metals, SVOCs, and volatile organic compound (VOCs) are considered PCOCs. Building 883 was constructed to handle uranium and metal rolling and forming operations. Beryllium, copper, and other metals and alloys were occasionally worked on in the building. Hydraulic oil used in the heavy machinery within the building occasionally leaked into the concrete pits beneath the equipment. Vapor degreasing (a hot solvent vapor process) was used to clean metal parts.

It is noted that PAC 800-1201 consists of radionuclide-contaminated surface soil south of Building 883, and therefore, radionuclides are the only PCOCs for this PAC.

2.2 Project Conditions

From a potential soil and debris remediation perspective, the most notable features of IHSS Group 800-3 are as follows:

- UBC 883, which is located beneath the Building 883 slab. The slab contains pits that formerly held heavy machinery used in the building.
- Tanks 25 and 26, which are OPWL tanks located in the basement of Building 883 (Figure 2).
- Resource Conservation and Recovery Act (RCRA) Tanks T-1 and T-2, which are acid etch tanks located in Room 139. These tanks have a concrete secondary containment; however, the Historical Release Report (HRR) (DOE 1992) notes that process wastewater overflowed from a tank in Room 139, and some of the water flowed under the wall.
- Valve Vault 2 (PAC 800-1200) and the New Process Waste Lines (NPWL) from the valve vault to Tanks T-1 and T-2 in Room 139. The line reportedly leaked (DOE 1992).
- PAC 800-1201, an area reported to have radionuclide-contaminated surface soil.
- Transformer Site 15, located just north of Building 883, where surface soil sample results indicate the presence of PCBs.
- The storage area west of Building 883, which may have some surface contamination based on undocumented historical knowledge.

2.3 RFCA SSRS

The SSRS is performed when non-radionuclides and uranium are present in soil below a depth of 6 inches, and when americium and plutonium are present below a depth of 3 feet (DOE et al 2003). Current site conditions are evaluated to determine whether remediation is required in accordance with the SSRS.

Subsurface soil data for IHSS Group 800-3 are not available. Therefore, the SSRS evaluation will be postponed until data from the IHSS Group 800-3 characterization have been collected in accordance with IA Sampling and Analysis Plan (SAP) (IASAP) Addendum #IA-04-06. Results will be documented in a data summary or closeout report.

2.4 Remediation Plan

This RSOP Notification remediation plan for IHSS Group 800-3 includes the following objectives:

- Remove the Building 883 slab, as well as the building footers and concrete pits and tanks to a depth of 3 feet below final grade. The concrete will be recycled in accordance with the RSOP for Recycling Concrete (DOE 1999, 2003b) or disposed at an appropriate facility based on waste characterization results.
- Remove soil with non-radionuclide or uranium contaminant concentrations greater than the RFCA wildlife refuge worker (WRW) ALs to a depth of 6 inches. If soil contamination greater than the ALs extends below 6 inches in depth, perform the SSRS to evaluate the need for further accelerated action.
- Remove soil with plutonium-239/240 or americium-241 activities greater than the RFCA WRW ALs to a depth of 3 feet, or to less than the applicable AL, which ever comes first. If concentrations are greater than 3 nanocuries per gram (nCi/g) between 3 and 6 feet, characterize and remediate pursuant to RFCA Attachment 5 (DOE et al 2003). If plutonium-239/240 or americium-241 is present at activities greater than the RFCA WRW AL but less than 3 nCi/g below 3 feet, conduct an SSRS.
- Consult with the regulatory agencies if contaminant concentrations are greater than the proposed ecological receptor ALs but lower than the WRW ALs.
- If contaminated soil is removed, collect confirmation soil samples in accordance with the IASAP (DOE 2001).

It is anticipated that after remediation there may be areas with concentrations of metals, radionuclides, and organics greater than background means plus two standard deviations or detection limits, but below RFCA ALs.

2.5 Stewardship Evaluation

Based on the PCOCs (Table 1) and the ER RSOP (DOE 2003a), it is anticipated that all contamination above RFCA ALs will be remediated. The following sections present the stewardship evaluation. If remediation is conducted, an additional stewardship evaluation will be performed during remediation using the consultative process and documented in a closeout report for IHSS Group 800-3. A new map of residual contamination will be generated after remediation.

2.5.1 Proximity to Other Contaminant Sources

IHSS Group 800-3 is located in the RFETS IA. With the exception of IHSS 000-162 (IA Group 000-2), the IHSS Group is 100 to 200 feet away from other neighboring IHSSs. IHSS 000-162 is located along Eighth Street from approximately Building 881 to the south end of Building 771, and is identified as an IHSS because the pavement on Eighth Street was reported to have several radioactively contaminated areas (DOE 1992). The nature of the contamination at IHSS 000-162 is not a factor for long-term stewardship considerations for IHSS Group 800-3.

2.5.2 Surface Water Protection

Surface water protection includes the following considerations:

Is there a pathway to surface water from potential erosion to streams and drainages?

Soil contaminants from IHSS Group 800-3 could migrate to surface water via erosion. IHSS Group 800-3 sits on the northern side of the drainage divide between South Walnut Creek and Woman Creek. Surface drainage from the IHSS Group is to the northeast where it is monitored by surface water station GS28, located just south of Central Avenue (DOE 2002a). Surface runoff is conveyed to the Central Avenue Ditch and ultimately to South Walnut Creek.

Do characterization data indicate there are contaminants in surface soil?

Existing soil data, as shown on Figure 2, indicate contaminant concentrations are less than RFCA WRW and ecological receptor ALs. However, concentrations of plutonium, americium, and uranium are higher than background levels. Additional sampling will be conducted in accordance with IASAP Addendum #IA-04-06 to further characterize IHSS Group 800-3. Results will be documented in a data summary or closeout report.

Do monitoring results from Points of Evaluation (POEs) or Points of Compliance (POCs) indicate there are surface water impacts from the area under consideration?

The findings for GS28 for Water Year 97-00 (the latest data) indicate a median plutonium concentration of 0.075 picocurie per liter (pCi/L), which was below the surface water action level of 0.15 pCi/L. However, the maximum concentration at this station was 0.852 pCi/L, which exceeded the surface water action level. Because runoff from Building 889/864 is also captured at this station, IHSS Group 800-3 cannot be conclusively identified as the source of the contamination. No other data have been collected at this station. Decontamination and Decommissioning (D&D) activities at Building 883 or elsewhere in the IA are not expected to contribute additional actinides to South Walnut Creek (DOE 2003c).

Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?

IHSS Group 800-3 is not located in an area subject to erosion in accordance with Figure 1 of RFCA Attachment 5 (DOE et al 2003).

2.5.3 Monitoring

Monitoring includes the following considerations:

Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?

Building 883 is monitored to evaluate contaminant releases to groundwater from D&D activities (DOE 2002b). Well installation and groundwater sampling activities that took place at this building during 2001 included the installation, development, and sampling of downgradient monitoring wells 83101 and 83201 (DOE 2002b). Existing monitoring wells 61099 and 61199, utilized as Building 883 upgradient wells, were also sampled. The analytical suite for Building 883 groundwater consisted of VOCs, metals, uranium isotopes, nitrate, PCBs, and total petroleum hydrocarbons (TPH). Table 2 presents a summary of Building 883 D&D groundwater monitoring data collected through calendar year 2001.

Table 2
Building 883 Historical D&D Groundwater Monitoring Data

Well	Location	Dates	Beryllium (ug/L)	Nitrate (mg/L)	U Isotopes (pCi/L)	TCE (ug/L)	PCE (ug/L)	Metals (ug/L)
61099	Upgradient	12/99	NS	NS	NS	1	27	-----
		3/01	NS	NS	U-233/234 1.33 U-235 0.067 U-238 0.916	2	26	-----
		12/01	U	5.9	U-233/234 1.19 U-235 0.0527 U-238 0.804	0.92	15	-----
61199	Upgradient	12/99	NS	NS	NS	12	220	-----
		3/01	NS	NS	U-233/234 2.75 U-235 0.14 U-238 1.59	17	230	-----
		12/01	U	4.9	U-233/234 2.33 U-235 0.165 U-238 1.17	12	160	Thallium 2.2
83101	Downgradient	12/01	U	4	U-233/234 8.14 U-235 0.636 U-238 7.56	8.6	29	Cadmium 5.3
83201	Downgradient	12/01	U	0.56	U-233/234 161 U-235 7.19 U-238 127	0.62	0.63	Mercury 2.9 Selenium 58.3 Thallium 3.6

Notes: Concentrations greater than Tier II groundwater ALs are shown in bold, concentrations greater than Tier I groundwater ALs are shown in italicized bold. U = non detect, NS = not sampled.

New D&D monitoring wells 83101 and 83201 and existing wells 61099 and 61199 produced full sample suites (VOCs, metals, uranium isotopes, nitrate, PCBs, and TPH) for the fourth quarter 2001. The results of this sampling indicate VOCs are present in concentrations greater than Tier II groundwater ALs at all wells except downgradient well 83201. Uranium-233/234 and uranium-238 were found at activities greater than Tier II groundwater ALs at wells 61099, 61199, and 83101, and at activities greater than Tier I groundwater ALs at well 83201. In addition, the uranium-235 activity at well 83201 was greater than the Tier II groundwater AL. All of the uranium isotope activities at well

83201 were greater than their respective background means plus 2 standard deviations. Beryllium was not detected at any locations. Nitrate was detected at all locations at concentrations less than the Tier II groundwater AL. A few metal concentrations above Tier II groundwater ALs were noted, most of which were observed at downgradient well 83201. There were no detections of PCBs at any well. TPH was detected in low concentrations at wells 61099 and 83201; however, neither a RFCA groundwater AL nor a Colorado Drinking Water Standard exists for TPH.

Can the impact be traced to a specific IHSS Group?

Based on the high concentrations of uranium in downgradient wells relative to upgradient wells at Building 883, IHSS Group 800-3 may be a source for this radionuclide in groundwater. The VOC impacts cannot be traced specifically to IHSS Group 800-3. These contaminants are considered part of the IA Plume.

Are additional monitoring stations needed?

Not at this time. The need for and placement of monitoring stations will be re-evaluated in the Long-Term Stewardship Plan.

Can existing monitoring locations be deleted if additional remediation is conducted?

Not at this time. The current network of four wells, including two upgradient and two downgradient, should be retained to continue monitoring potential groundwater impacts from IHSS Group 800-3.

2.5.4 Stewardship Actions and Recommendations

The current stewardship actions and recommendations for IHSS Group 800-3 include:

- Use Best Management Practices (BMPs) to reduce erosion into surface water drainage.
- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following:
 - Fencing and signs to restrict access; and
 - Soil excavations controlled through the Site Soil Disturbance Permit process.
- Implement long-term stewardship actions, including the following:
 - Prohibitions on construction of buildings in the IA;
 - Restrictions on excavations or other soil disturbance; and
 - Prohibitions on groundwater pumping in the area of IHSS Group 800-3.

These recommendations may change based on in-process remediation activities and other future RFETS remediation decisions.

2.6 Accelerated Action Remediation Goals

ER RSOP remedial action objectives (RAOs) include the following:

- Provide a remedy consistent with the RFETS goal of protection of human health and the environment;
- Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls; and
- Minimize the spread of contaminants during implementation of accelerated actions.

2.7 Treatment

Not applicable.

2.8 Project-Specific Monitoring

High-volume air samplers may be used at the remediation area consistent with work controls to determine airborne radioactivity concentrations. Approximate locations of air samplers are shown on Figure 2.

2.9 RCRA Units and Intended Waste Disposition

Tanks T-1 and T-2 will be closed in accordance with the Facility Component Removal RSOP (DOE 2002c).

2.10 Administrative Record Documents

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, Colorado, June.

DOE, 1999, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2002, Final Automated Surface Water Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002, Final 2001 Annual RFCA Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, RFCA Standard Operating Protocol for Facility Component Removal, Size Reduction, and Decontamination Activities, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2003, RFCA Standard Operating Protocol for Recycling Concrete, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003, Automated Surface Water Monitoring Second Quarter FY03 (Jan.-March 2003), Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, CDPHE, and EPA, 1996, Final Rocky Flats Cleanup Agreement, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, July.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

2.11 Projected Schedule

Remediation of IHSS Group 800-3 is expected to begin in third quarter of FY04.

3.0 PUBLIC PARTICIPATION

ER RSOP Notification #04-06 activities were discussed at the November 2003 ER/D&D Status Meeting. This Notification was provided to the local governments. It is available at the Rocky Flats Reading Rooms and on the Environmental Data Dynamic Information Exchange (EDDIE) Website at www.rfets.gov.

4.0 REFERENCES

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, Colorado, June.

DOE, 1999, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2002a, Final Automated Surface Water Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2002b, Final 2001 Annual RFCA Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002c, RFCA Standard Operating Protocol for Facility Component Removal, Size Reduction, and Decontamination Activities, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2003a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, RFCA Standard Operating Protocol for Recycling Concrete, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003c, Automated Surface Water Monitoring Second Quarter FY03 (January-March 2003), Rocky Flats Environmental Technology Site, Golden, Colorado.

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DOE, CDPHE, EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

Figure 1
IHSS Group 800-3
Location Map

KEY



UBC



PAC



Demolished building



Standing building

Paved area

Dirt road

Stream, ditch, or drainage



Scale = 1:6,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared for:



Prepared by:

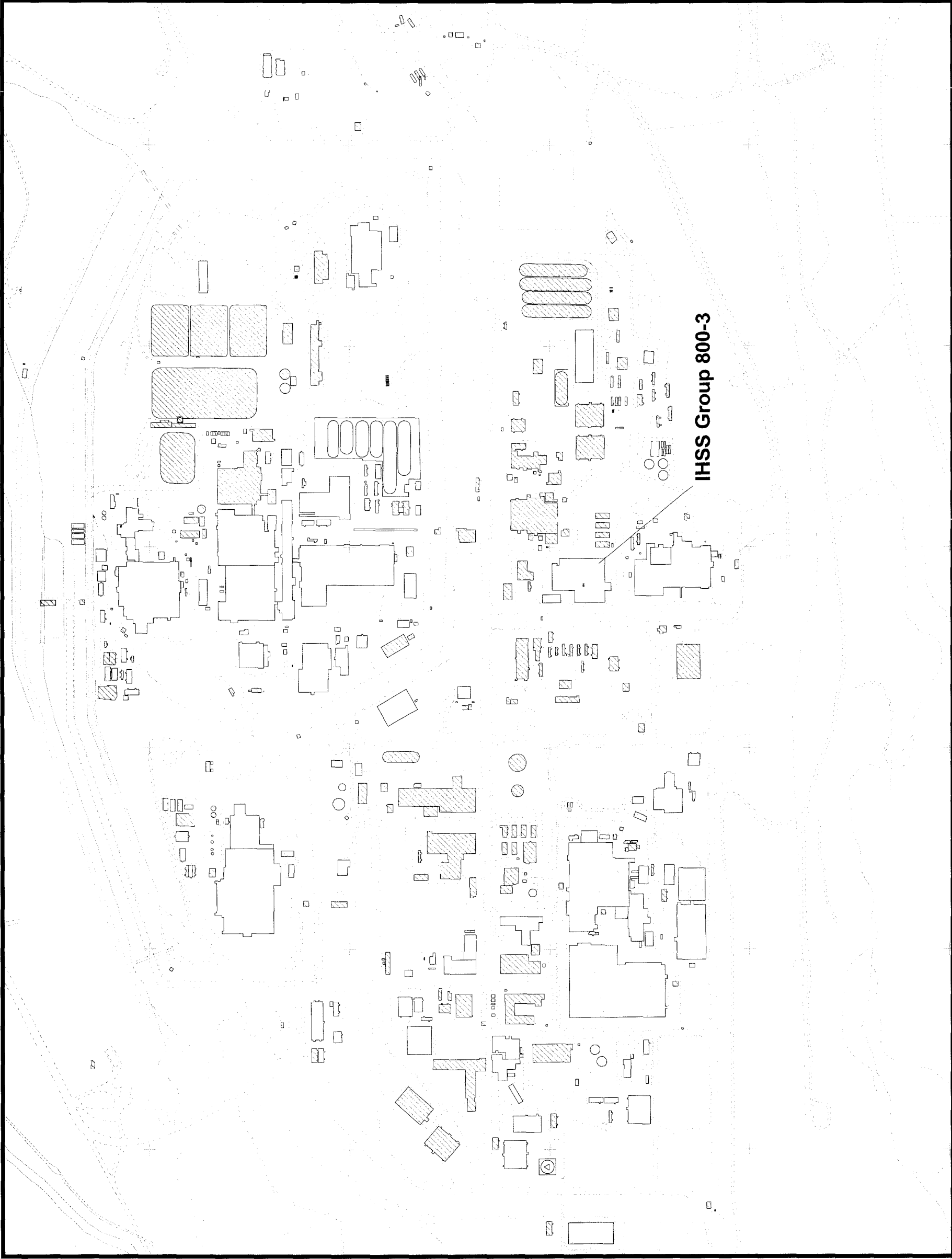









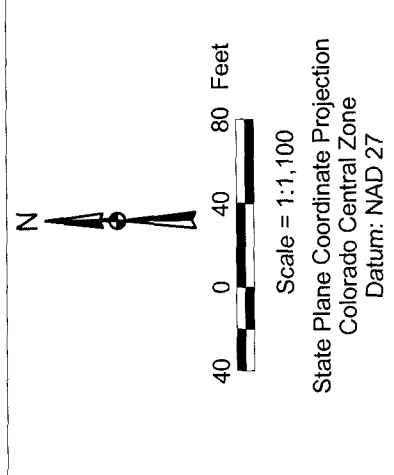


Figure 2
IHSS Group 800-3
Existing Sampling Locations With
Concentrations Greater Than
Background Means Plus Two
Standard Deviations or
Method Detection Limits


KEY

	UBC
	PAC
	Demolished building
	Standing building
	Paved area
	Dirt road
	Stream, ditch, or drainage
	Foundation drain
	Approximate air sampling location




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